

The following pages replace the Table of Contents for Chapter 2, Volume 1. This Table of Contents is revised to reflect changes to Chapter 2 that have been made to address Technical deficiencies.

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Chapter 2

R645-301-200

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APPENDICES

2-1	2006-2007 Soil Survey Report
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DRAWINGS

2-1	Soil Survey Map
2-2	Topsoil Handling Sequence and Stockpile Map

The following pages replace 2-21 through 2-29 in Chapter 2. These pages are submitted to address the deficiencies located in the Chapter 2 main text related to Section R645-301-230, Operations Plan. The following is a listing of each deficiency followed by a description of the specific change(s) made to address the deficiency:

R645-301-234.230, The Applicant must describe the stockpile interim seed mix by species and planting rates.

The stockpile interim seed mix is provided on page 2-25 in Section 234.230.

R645-301-232.500, Commitments made concerning topsoil and subsoil sampling in Sec. 232.500; Sec. 5, pg. 5-3, App. 2-1; and Sec. 232.720 are appropriate, but in each case, the commitment should include the rate of sampling, i.e. number of samples to be taken by ton or by cubic yardage moved. • Overburden monitoring described in Sec. 5, pg. 5-3, App. 2-1 should include SAR analysis.

A detailed topsoil and subsoil sampling program is provided on page 2-24 in Section 232.500. Chapter 5, Page 5-3 in Appendix 2-1 has been edited to reference this sampling program. The Appendix 2-1 edits are in the Chapter 2 edits of this submittal under a separate cover page. Also, it is clarified that SAR will be one of the parameters monitored in this sampling program.

R645-301-242.200, Section 242.110 should indicate that the slopes will be roughly graded, rather than a smooth surface, prior to subsoil and topsoil application.

Based on discussion with Division staff, the word "smoothed" has been changed to "leveled". This edit is located on page 2-26 in Section 242.110.

R645-301-244.100, The application must describe the use of surface roughening, wood fiber mulch and tackifier on all stockpiles (spoil, topsoil and subsoil piles) •Section 242.120 (b) must describe seeding, and an application of wood fiber mulch and tackifier immediately following topsoil application, regardless of season. •Section 244.200 must describe the mulch application by type of mulch, application method, and application rate for each post mining land use.

Section 244.100 has edits describing soil stabilization and air pollution control measures that will be taken for stockpiles, located on page 2-28. Section 242.120 defines the seeding method and references the appropriate sections where seeding and mulching details can be found. These edits are on page 2-27. Section 242.130 is edited to address air pollution from reclaim areas that have topsoil but not yet seeded by using tackifier (Page 2-27). Section 244.200 describes in detail the mulching methods that will be implemented. Mulching practices following seeding have been extended to all reclamation. Mulching details are found on page 2-29.

R645-301-244.200, Section 242.120(b) of the application states that the topsoil surface will be disced prior to seeding in most instances, but that compacted areas will be treated with ripping. How will the compaction be measured and determined?

Section 242.120 has been revised to clarify how compaction will be measured and determined. This revision is found on page 2-27.

R645-301-244.320, The commitment to repair rills and gullies provided in Section 244.320 (b) must include replacement of topsoil and reseeding or replanting.

This commitment is made in the revisions on page 2-29 in Section 244.320.

In addition to these edits and revisions that directly address deficiencies, Section 243 on page 2-28 and Section 231.300 on page 2-22 have also been edited to address monitoring soils after placement during reclamation. These changes are initiated based on the detailed sampling program during the soils salvaging program that is presented in 232.500.

222.400 Present and Potential Productivity of Existing Soils

Soils in the Coal Hollow project area support big sagebrush, grasses (native and introduced species), pinyon pine, Utah juniper, and Gambel oak. Detailed descriptions of the present and potential productivity of the soils are detailed in Chapter 3, Section 321.200.

223. Soil Characterization

This soil survey was made in accordance with the guidelines for an order 2 soil survey as detailed in the Soil Survey manual (USDA 1993). Soils were classified using the Keys to Soil Taxonomy, Ninth Edition (USDA 2003). Representative soil samples were submitted for laboratory analysis of the parameters outlined by the Utah Division of Oil Gas and Mining's *Guidelines for Management of Topsoil and Overburden* (2005).

224. Substitute Topsoil

Based on the 2006-2007 order 2 soil survey, sufficient quantities of suitable topsoil and subsoil are available for reclamation within the project area. The Coal Hollow Project does not plan to use substitute material for topsoil at the time of reclamation. However, if in the future the Coal Hollow mine plan proposes to use selected overburden materials as a supplement or substitute for topsoil, an application will be provided to the DOGM that includes results of analyses, trials, and tests as described under R645-301-232.100 through R645-301-232.600, R645-301-234, R645-301-242, and R645-301-243. DOGM may also require the results of field-site trials or greenhouse tests as required under R645-301-233.

230. **Operation Plan**

231. General Requirements

231.100. Methods for Removing and Storing Subsoil and Topsoil

The methods for removing and storing topsoil, subsoil, and other materials will be to first remove the woody plants from the area and place them in piles for later placement in pit backfills. Next, dozers or scrapers will remove the topsoil layer to a depth determined by the soil survey. The topsoil will be stockpiled and protected from wind and water erosion. Stockpiles that will be in place for less than 1 year will be coated with a tackifier at the manufacturer's suggested rate for dust control applications. Those stockpiles that will be in place for at least one year will be seeded and covered with mulch during the appropriate season. Side slopes of stockpiles will be sloped to 3h:1v. The suitable subsoil will then be removed and stockpiled separately from the topsoil. The depth of topsoil and subsoil salvage will be determined by the aforementioned soil survey and in the field during mining by the Coal Hollow environmental technician in consultation with a certified professional soil scientist. Stockpiling of topsoil and subsoil will only occur when direct placement (or live hauling) is not operationally practical. Drawing 2-2 shows planned topsoil stockpiles and topsoil removal plans.

231.200. Suitable Substitute Topsoil

The use of substitute topsoil is not planned based on the 2007 soil survey information. Demonstration studies of the suitability of topsoil substitutes or supplements will be submitted to the DOGM if the use of topsoil substitutes become necessary for future reclamation and revegetation.

231.300. Soil Testing for Reclamation

The final seedbed of the reclaimed areas will be prepared by first replacing the subsoil and topsoil in the same order it existed prior to removal by the mining activities. Next, a basic topsoil (top 8 inches of reclamation profile) sampling regime will be implemented prior to seeding that should identify fertility problems and will provide a basis for determining necessary soil amendments. The parameters analyzed will be:

Available phosphorus (P)
Soluble Potassium (K)
Nitrate-Nitrogen

One composite sample will be collected from approximately every 2 to 5 acres based on soil types and variability. Each composite will be comprised of at least 4 sub-samples.

Pre-testing of the soils has been conducted as part of the soils survey. Results from the pre-testing of topsoil and subsoil can be viewed in Table C-1 of Appendix 2-1 (native topsoil and subsoil) and Table C-2 (samples from core hole/overburden pits) of Appendix 2-1.

231.400. Topsoil Handling

The topsoil will be removed from the mine area and either live hauled to a reclamation area or stored separately. All soil stockpiles will be seeded with an appropriate interim seed mix to prevent loss and deterioration by wind and water erosion. Soil stockpiles will have side slopes graded to a maximum 3h:1v. Piles will be bermed or otherwise treated to prevent the transport of sediments away from the pile. Details about soil horizons and zones planned for use as subsoil are detailed in Appendix 2-1. A detailed map showing stockpile designs/locations and soil removal are shown on Drawing 2-2.

232. Topsoil and Subsoil Removal

232.100. Separate Layers

All soil materials will be removed in separate layers from the area to be disturbed, and segregated.

Based on soil map units, average depths have been estimated and will be used as a guide and monitored in the field. Refer to Table 4-2 in Appendix 2-1. Soil will be salvaged and directly placed or stockpiled as either topsoil or subsoil.

232.200. Topsoil of Insufficient Quantity or Quality

Where the topsoil is of insufficient quantity or poor quality for sustaining vegetation, other materials approved by the DOGM in accordance with R645-301-233.100 will be removed as a separate layer from the area to be disturbed, and segregated.

Based on the Soil Survey, there should be sufficient quantities of topsoil to place an average of eight inches of topsoil across all reclaimed areas.

232.300. Shallow Topsoil Handling

If topsoil is less than six inches thick, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil.

Sufficient quantities of topsoil are estimated to be available for replacement of an average eight inches of topsoil across reclamation, with a minimum of six inches. Therefore, mixing of topsoil with subsoil is not anticipated to be necessary

232.400 - 232.420. Topsoil Removal Exceptions

UDOGM will not require the removal of topsoil for minor disturbances which occur at the site of small structures, such as power poles, signs, or fence lines. Removal of topsoil will not be required when the disturbances will not destroy the existing vegetation and will not cause erosion.

232.500. Subsoil Segregation

The Coal Hollow Project plans to remove soils as either topsoil or subsoil based on the completed soil survey. DOGM may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the requirements of R645-301-234 and R645-301-242 if it finds that such subsoil layers are necessary to comply with the revegetation requirements of R645-301-353 through R645-301-357.

Refer to Table 4-2 in Appendix 2-1, which contains estimated subsoil salvage depths. In addition, substitute subsoil has been identified in the layers between the identified topsoil layer and the Tropic Shale. Sufficient quantities of this material are available to live haul most of the subsoil with the exception of one stockpile that will be constructed from the initial mining area and reserved for reclamation of the final mining area. All substitute subsoil materials will be sampled and tested for pH, conductivity, SAR, percent lime, and texture, prior to salvage and stockpiling.

The following soil sampling program will be conducted during the initial mining process:

- Topsoil: Sampling will occur every 2 to 4 acres or approximately every 2,500 to 5,000 bank cubic yards.
- Subsoil: Sampling will occur every 2 to 3 acres or approximately every 10,000 to 15,000 bank cubic yards.

These samples are anticipated to be composites of individual samples taken throughout the week during the time frames that topsoil and subsoil are being salvaged. These individual samples would be taken five days a week and composited to a single sample representing the material moved each week. The parameters that will be analyzed for topsoil are found in Table 4-1 of Appendix 2-1.

Following the initial mining process (approximately 1 year), this sampling program will be reviewed to determine the appropriate level of sampling necessary to ensure adequacy of topsoil and subsoil used in reclamation for all subsequent mining.

232.600. Timing

All material to be removed under R645-301-232 will be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place. Drawing 2-2 shows the anticipated topsoil removal sequence and stockpiling.

232.700. Topsoil & Subsoil Removal Under Adverse Conditions

An exception to the requirements of R645-301-232 to remove topsoil or subsoils in a separate layer from an area to be disturbed by surface operations may be granted by UDOGM where the operator can demonstrate;

232.710. Unsafe Conditions

The removal of soils in a separate layer from the area by the use of conventional machines would be unsafe or impractical because of the slope or other conditions of the terrain or because of the rockiness or limited depth of the soils.

These conditions are not anticipated in the Coal Hollow project area.

232.720. Lack of On-Site Material Available

If the requirements of R645-301-233 have been or will be fulfilled with regard to the use of substitute soil materials unless no available substitute material can be made suitable for achieving the revegetation standards of R645-301-356, then the operator will, as a condition of the permit, be required to import soil material of the quality and quantity necessary to achieve such revegetation standards.

The soil survey indicates that there are sufficient quantities of topsoil and subsoil to adequately reclaim the mined area with 48 inches of combined cover. If additional materials are needed, then Alton Coal Development (ACD) will salvage suitable overburden for use as substitute subsoil material from the zone below the topsoil layer

(8 inches thick average) to a maximum depth of 30 feet, excluding any Tropic shale materials. ACD will do additional sampling to identify the zones in which suitable materials occur for maximum salvage potential of substitute subsoil. Representative overburden samples will be analyzed for pH, conductivity, SAR, percent lime, and texture. A detailed description of subsoil sampling is provided in Section 232.500.

233.100 - 400 Topsoil Substitutes and Supplements.

Based on the Soil Survey contained in Appendix 2-1, topsoil substitutes and supplements are not anticipated to be necessary. This survey estimates that nine inches of topsoil can be replaced across the reclamation area.

234. Topsoil Storage

234.100. Stockpiles

Materials removed under R645-301-232.100, R645-301-232.200, and R645-301-232.300 will be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas. Drawing 2-2 shows the planned stockpile areas, anticipated storage time, quantities and size.

234.200. Requirements of Stockpiles

Stockpiled materials will be subject to the following conditions.

234.210. (a) They will be selectively placed on a stable site within the permit area. Areas are shown on Drawing 2-2.

234.220. (b) They will be protected from contaminants and unnecessary compaction that would interfere with revegetation.

234.230. (c) They will be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the UDOGM. The side slopes will be graded to a maximum 3h:1v. Drawing 2-2 shows the planned stockpile areas, anticipated storage time, quantities and size. The interim seed mix for the stockpiles is the following:

Stockpile Interim Seed Mix		
		Rate (PLS/Acre)
Bromus carinatus	Mountain Brome	6
Elymus lanceolatus	Thickspike wheatgrass	4
Elymus amithii	Western wheatgrass	5
Elymus spicatus	Bluebunch wheatgrass	6
Poa pratensis	Kentucky bluegrass	0.4
Total		21.40

- 234.240. (d) They will not be moved until required for redistribution unless approved by the UDOGM. Anticipated storage time for each stockpile is shown on Drawing 2-2.

234.300. Long-Term Disturbance & Stockpiling

When long-term disturbed areas will result from facilities and preparation plants and when stockpiling of materials removed under 8645-301-232.100 would be detrimental to the quality or quantity of those materials, DOGM may approve the temporary distribution of the soil materials removed to an approved site within the permit area to enhance the current use of that site until later when needed for reclamation, provided that the following conditions occur.

234.310. Such action will not permanently diminish the capability of the topsoil of the host site.

234.320. The material will be retained in a condition more suitable for redistribution than if stockpiled.

240. Reclamation Plan (General Requirements)

A detailed Order 2 soil survey has been completed in 2006 and 2007. This information provides detail for onsite soil suitability, salvage depths, and volumes available for reclamation of the mine site. Dozers or Scrapers will replace the subsoil and topsoil. The topsoil is estimated to average 8 inches and the subsoil will be approximately 39 inches in thickness. The total profile of topsoil and subsoil is estimated to average 48 inches.

242. Soil Redistribution

242.100. Topsoil materials removed under R645-301-232.100, R645-301-232.200, and R645-301-232.300 and stored under R645-301-234 will be redistributed in a manner that meets the following conditions.

242.110. (a) The material achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems. All slopes will be appropriately graded and leveled prior to placement of topsoil and subsoil layers. Soil layer thicknesses will be regularly checked using a high precision GPS system and spot checking by the ACD environmental technician.

242.120. (b) Reduced material handling of the soil resource prevents excess compaction. Material handling will be minimized by direct hauling and placing materials when operationally practical rather than stockpiling. Materials will be spread by a dozer or scrapers and spread only as much as necessary to obtain the required uniform thickness. Traffic from rubber tired equipment across topsoil and subsoil will be minimized.

If heavy equipment operation results in excessive soil compaction at the surface of the reclaimed areas, they will then be ripped, disked, and harrowed to loosen the seedbed prior to seeding. Excessive compaction that could impact seeding success will be determined by observation and judgment of an environmental professional. In other areas where less compaction has occurred, the areas will be disked and harrowed. The disking and harrowing of all areas will be done parallel with the contour wherever possible to decrease the potential for water erosion downslope. In other areas where compaction is not a problem, dozer tracking can be used to roughen the surface, and to trap seed, fertilizer, mulch, and other amendments as well as decrease erosion by wind and water. In such cases seeding will be done immediately after this treatment, whereas soil amendments, where required, would be applied over the surface during seedbed preparations. Seeding will mainly occur in the early spring and late fall. Seeding will be accomplished by the seed drilling method followed by mulching as described in Section 244.200. Seed mixtures and rates can be viewed in Tables 3-37 through 3-42 in Chapter 3, Volume 2.

- 242.130. (c) Handling procedures will be implemented to protect the materials from wind and water erosion before and after seeding and planting. Reclamation will be graded to the planned slope angles, not to exceed 3h:1v. Soil layers will sloped as the material is relocated to the reclaim areas. Once soil is placed, seeding will occur at the earliest appropriate season suitable to planting conditions. If the season is not appropriate for seeding at the time of topsoil placement, the topsoil will then be coated with a tackifier at the manufacturer's suggested rate for dust control applications. Mulching will be implemented on all reclamation to control erosion following seeding.

242.200. Treatments of Material to be Redistributed

Before redistribution of the materials removed under R645-301-232, the regraded land will be treated if necessary to reduce potential slippage of the redistributed material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after the material is replaced. Potential for slippage is anticipated to be minimal based on the planned slope angles for reclamation.

242.300. Soil Redistribution on Impoundments & Roads

DOGM may not require the redistribution of topsoil or topsoil substitutes on the approved postmining embankments of permanent impoundments or roads if it determines the following.

- 242.310. (a) Placement of topsoil or topsoil substitutes on such embankments is inconsistent with the requirement to use the best technology currently available to prevent sedimentation.
- 242.320. (b) Such embankments will be otherwise stabilized.

243. Soil Nutrients & Amendments

Nutrients and soil amendments will be applied to the redistributed material when necessary to establish the vegetative cover. The final seedbed of the reclaimed areas will be prepared by first replacing the subsoil and topsoil. Next, a basic topsoil (top 8 inches of reclamation profile) sampling regime will be implemented prior to seeding that should identify fertility problems and will provide a basis for determining necessary soil amendments. The parameters analyzed will be:

Available phosphorus (P)
Soluble Potassium (K)
Nitrate-Nitrogen

One composite sample will be collected from approximately every 2 to 5 acres based on soil types and variability. Each composite will be comprised of at least 4 sub-samples.

Pre-testing of the soils has been conducted as part of the soils survey. Results from the pre-testing of topsoil and subsoil can be viewed in Table C-1 of Appendix 2-1 (native topsoil and subsoil) and Table C-2 (samples from core hole/overburden pits) of Appendix 2-1.

244. Soil Stabilization

244.100. Erosion Protection from Wind & Water

All exposed surface areas will be protected and stabilized to effectively control erosion and air pollution attendant to erosion. Reclamation will be regraded to the planned slope angles, not to exceed 3h:1v. Soil layers will be sloped as the material is relocated to the reclaim areas. Once soil is placed, seeding will occur at the earliest appropriate season suitable to planting conditions. Grass matting, mulching and/or cross ditches will be implemented as necessary to control erosion.

Temporary stockpiles that will be in place for more than 1 year will be seeded with the temporary seed mix provided in Section 234.230 and mulched by one of the methods described in Section 244.200. Temporary stockpiles that will be in place for less than one year will be coated with a tackifier at the manufacturer's suggested rate for dust control applications.

244.200. Mulch

Suitable mulch and other soil stabilizing practices will be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. DOGM may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

Mulch will be placed on the seedbed surface once soil amendments have been incorporated and seeding has been accomplished. Mulching will occur by one of the

following methods:

- Certified noxious weed free straw applied at a rate of 1 ton/acre anchored by crimping or a chemical binder.
- Wood fiber hydromulch at a rate of $\frac{3}{4}$ ton per acre for slopes flatter than 3:1 and 1 ton per acre for slopes at 3:1 which is the steepest slope planned at the project. This hydromulch would be anchored with a chemical binder at the manufacturer's suggested rate.

The mulch should control erosion by wind and water, decrease evaporation and seed predation, and increase survivability of the seeded species. Since there is only one post mining land use, mulching will follow one of the above described methods for all reclaim areas.

244.300. Rills & Gullies

Rills and gullies that form in areas that have been regraded and topsoiled that cause the following conditions will have the topsoil replaced followed by reseeding or replanting if the following occurs.

244.310. (a) If they disrupt the approved postmining land use or the reestablishment of the vegetative cover.

244.320. (b) If they cause or contribute to a violation of water quality standards for receiving streams will be filled, regraded, or otherwise stabilized; topsoil will be replaced; and the areas will be reseeded or planted.

250. PERFORMANCE STANDARDS

251. Topsoil & Subsoil Removed

All topsoil, subsoil and topsoil substitutes or supplements will be removed, maintained and redistributed according to the plan given under R645-301-230 and R645-301-240.

252. Topsoil & Subsoil Stockpiled

All stockpiled topsoil, subsoil and topsoil substitutes or supplements will be located, maintained and redistributed according to plans given under R645-301-230 and R645-301-240.

R645-301-121.200 *There should be a cover page for the soils analysis located in Appendix 2-1 to indicate that they are Appendix C of Appendix 2-1. • Energy Laboratories, Inc reports found in Appendix 2-1 for CH-01, CH—03, CH-06 do not include water extractable Selenium which was analyzed and reported for these same samples in Appendix 6-2. Please provide the Energy Laboratories, Inc. water soluble selenium analysis in Appendix 2-1 or reference the location of the information in Appendix 6-2.*

This cover page is added to Appendix 2-1 at the front of Appendix C – Soils Laboratory Data. This page also provides a reference to Appendix 6-2 for the water soluble Selenium analysis data for CH-01, CH-03 and CH-06.

Appendix C of Appendix 2-1

Soils Laboratory Data

(Water extractable Selenium analysis for CH-01, CH-03 and
CH-06 is located in Appendix 6-2)

R645-301-231.100, Page 4-1 of Appendix 2-1 suggests that poor soil is indicated by pH greater than 8.5, EC less than 4.0, and SAR less than 4. These latter two criteria (EC, SAR) do not reflect the criteria for poor soil described in Table 4-1, which does reflect the UDOGM soil suitability criteria. Please correct the narrative accordingly, so that the basis for subsoil suitability and salvage is clear.

The following pages replace Chapter 4 in Appendix 2-1, Chapter 2, Volume 1. The following is the list of changes in this chapter:

- The first paragraph in Soils - Section 4 was edited per UDOGM's request for clarification. The word poor was deleted at the beginning of line 2. The phrase "...pH (greater than 8.5)..." was changed to "...pH (less than 8.5)...".
- A small delineation of map unit 3 in the southeast corner of the Year 1 area was changed to map unit 2. This change was made after soil depths were checked on October 2, 2008 and found to be 27 inches to shale. Map unit 3 consists of very deep (greater than 60 inches deep) soils, while map unit 2 contains moderately deep (20 to 40 inches deep) and very deep soils. This soil map update corresponds with geologic drilling results, which found that the depth to shale was shallower in this area.

The change consists of 1.5 acres in the Year 1 area and 0.9 acres in the Year 2 area.

This change only affects tables 4-3.1, 4-3.2, 4-5, and 4-6. Topsoil, Good/Fair Subsoil, and Poor Subsoil quantities and depths were updated accordingly in these tables for map units 2 and 3.

The net change in replaceable soil profile depth was two inches in Year 1 and less than one inch for the permit area. The estimated amount of salvageable materials still results in an estimated replaceable soil depth of 67 inches, which is substantially more than the 48 inches required by Utah DOGM.

- Table 4-4 and Table 4-5 are updated to reflect the changes in the disturbance area for the facilities and the water system.

Soil Limiting Features

Topsoil and subsoil salvage depths were determined by the depth to carbonates, soil pH (less than 8.5), salinity (EC less than 4.0), sodicity (SAR less than 4), texture and depth to parent material. Clayey soils, carbonate accumulations and corresponding poor pH are the primary limiting soil features in the Coal Hollow project area. The depth to each of these limiting soil features varies by soil type and map unit.

The determination of good, fair, poor, or unsuitable qualities of the topsoil and subsoil is based on the soil suitability criteria established by the Utah Division of Oil Gas and Mining's Guidelines for Management of Topsoil and Overburden (Utah DOGM, 2005). The Utah DOGM suitability guidelines are summarized in table 4-1.

Table 4-1. Soil suitability and unsuitability criteria (Utah DOGM, 2005).

Criteria	Good	Fair	Poor	Unacceptable
Saturation %	25 to 55	≥56 to 80	<25 or >80	
pH	6.5 to 8.2	6.0 to 6.4 8.2 to 8.5	5.5 to 6.0 8.6 to 9.0	<5.5 >9.0
EC (mS/cm 25°C)	0 to 4	4 to 8	8 to 15	>15
SAR	0 to 4	5 to 10	10 to 14	>14
CaCO ₃ %	<15	15 to 30	>30	
Texture	sl, l, sil, scl, vfsl, fsl	cl, sicl, sc, ls, lfs	sic, s, sc, c, cos, fs, vfs	g, vcoss
Total Organic Carbon	<10%			≤10%
Available Water Capacity	>0.10 moderate	0.05 to 0.10 low	<0.05 very low	
K factor	<0.37	0.37	>0.37	

Topsoil and Subsoil Salvage Depths

Table 4-2 identifies the depth of topsoil, subsoil, and clayey subsoil that may be available for salvage based on field evaluations of soil pits and laboratory analysis of soil samples. Salvage depths may include some poor quality materials when the weighted average of mixed soil is still within the fair range. Field data sheets are in appendix B. Results of the laboratory analysis of soil samples are contained in appendix C.

Section Four

Topsoil & Subsoil Salvage

Soils with less than good EC and SAR qualities were not included in the salvage depths.

Clayey subsoil (clay and silty clay) is common in the Coal Hollow project area. It is of lesser quality relative to the other subsoil, but will be needed to achieve an adequate reclamation soil profile depth.

Actual topsoil and subsoil salvage depths will be closely monitored by Alton Coal Development staff in consultation with a certified professional soil scientist to ensure that unsuitable materials are not incorporated into the topsoil and subsoil stockpiles or placed directly into the reclamation soil profile.

Table 4-2. Topsoil and subsoil salvage depths by map unit in disturbance area.

Map Unit	Percent of Map Unit	Soil Types	Topsoil Depth inches	Good/ Fair Subsoil Depth Inches	Poor Subsoil Depth Inches	Average Total Salvage Depth Inches
	%					
1		<u>A Family – Wapiti Family complex, 3 to 8 percent slopes</u>				
	65	A Family	9	17	64	
	15	Wapiti Family	7	57	21	
	10	D Family	11	16	59	
	5	Manzanst Family	6	24	0	
	5	N Family	8	12	85	
		Average salvage depths ¹	9	23	55	87
2		<u>M family – Calendar Family - D Family complex, 3 to 8 percent slopes</u>				
	60	M Family	7	14	9	
	25	Calendar Family	5	23	14	
	15	D Family	11	16	59	
		Average salvage depths ¹	7	17	18	42
3		<u>Cibique Family – Wapiti Family complex, 3 to 8 percent slopes</u>				
	60	Cibique Family	6	0	66	
	30	Wapiti Family	7	57	21	
	5	A Family	9	17	64	
	5	Calendar Family	5	23	14	
		Average salvage depths ¹	6	19	50	75
4		<u>Jonale Family – Graystone cobbly substratum Family – Wapiti Family complex, 3 to 8 percent slopes</u>				
	50	Jonale Family	9	23	47	
	25	Graystone cobbly substratum Family	12	20	0	
	15	Wapiti Family	7	57	21	
	5	D Family	11	16	59	
	5	A Family	9	17	64	
		Average salvage depths ¹	10	27	33	70
5		<u>Calendar Family – M Family - Driffty Family complex, 8 to 25 percent slopes</u>				
	40	Calendar Family	5	23	14	
	30	M Family	7	14	9	
	20	Driffty Family	10	0	0	
	10	Zigzag	4	15	0	
		Average salvage depths ¹	7	15	8	30

Section Four

Topsoil & Subsoil Salvage

Map Unit	Percent of Map Unit	Soil Types	Topsoil Depth inches	Good/ Fair Subsoil Depth Inches	Poor Subsoil Depth Inches	Average Total Salvage Depth Inches
6		<u>Graystone – Cookcan – Jonale Family complex, 1 to 5 percent slopes</u>				
	45	Graystone	12	50	20	
	20	Cookcan	6	42	0	
	20	Jonale Family	9	23	47	
	15	I Family	12	42	0	
		Average salvage depths ¹	10	42	18	70
7		<u>Happyhollow Family - Alamosa complex, 1 to 5 percent slopes</u>				
	55	Happyhollow Family	11	21	42	
	20	Alamosa	10	81	0	
	10	Jicarilla Family	7	47	42	
	10	Tetonview Family	8	16	0	
	3	Brumley	9	76	0	
	2	Jonale Family	9	23	47	
		Average salvage depths ¹	10	37	28	75
8		<u>Brumley – Graystone - Snilloc complex, 3 to 8 percent slopes</u>				
	40	Brumley	9	76	0	
	30	Graystone	13	55	11	
	20	Snilloc	8	28	60	
	10	Jonale Family	9	23	47	
		Average salvage depths ¹	10	55	20	85
9		<u>D Family - Deacon complex, 5 to 30 percent slopes</u>				
	55	D Family	11	16	59	
	30	Deacon	9	27	12	
	10	A Family	9	17	64	
	5	Creek bottom	0	0	0	
		Average salvage depths ¹	10	19	42	71
10		<u>Zigzag clay loam, 8 to 25 percent slopes</u>				
	85	Zigzag	4	14	0	
	10	Driffty Family	10	0	0	
	5	Calendar Family	5	23	14	
		Average salvage depths ¹	5	13	1	19
11		<u>A family, 8 to 25 percent slopes</u>				
	85	A Family	9	17	64	
	10	Calendar Family	5	23	14	
	5	Zigzag	4	14	0	
		Average salvage depths ¹	8	17	56	81
12		<u>Manzanst Family clay loam, 3 to 12 percent slopes</u>				
	85	Manzanst Family very deep to shale	6	0	24	
	10	Manzanst Family deep to shale	6	0	20	
	5	A Family	9	17	64	
		Average salvage depths ¹	6	1	26	33
13		<u>A Family – Happyhollow Family complex, 1 to 5 percent slopes</u>				
	80	A Family	9	17	64	
	15	Happyhollow Family	11	21	42	
	5	I Family	12	42	0	
		Average salvage depths ¹	9	19	58	86
1. Weighted average salvage depths for map unit are the sum of soil type salvage depths multiplied by percent of map unit.						

Section Four

Topsoil & Subsoil Salvage

Topsoil and Subsoil Quantities

The estimated quantities of topsoil and subsoil that will be salvaged from mining disturbance areas are contained in tables 4-3.1, 4-3.2, and 4-3.3. The estimated quantities of salvaged topsoil where facilities, roads, and stockpiles will be constructed are contained in table 4-4. Drawing 2-2 shows the topsoil and subsoil handling plan.

Table 4-3.1. Estimated topsoil and subsoil quantities that can be salvaged from year 1 mining disturbance areas.

Map Unit	Area	Topsoil	Good/ Fair Subsoil	Poor Subsoil
	acres	Cubic Yards	Cubic Yards	Cubic Yards
1	23.6	28,556	72,976	174,509
2	7.2	6,776	16,456	17,424
3	25.2	20,328	64,372	169,400
4	74.5	100,161	270,435	330,532
5	13.3	12,517	26,822	14,305
6	14.7	19,763	83,006	35,574
7	2.1	2,823	10,446	7,905
8	0.4	538	2,958	1,076
9	7.4	9,949	18,903	41,785
10	0.0	0	0	0
11	5.2	5,593	11,885	39,150
12	4.7	3,791	632	16,429
13	0.1	121	255	780
Total	178.4	210,916	579,146	848,869

Table 4-3.2. Estimated topsoil and subsoil quantities that can be salvaged from year 2 mining disturbance areas.

Map Unit	Area	Topsoil	Good/ Fair Subsoil	Poor Subsoil
	acres	Cubic Yards	Cubic Yards	Cubic Yards
1	0.0	0	0	0
2	0.0	847	2,057	2,178
3	19.4	15,649	49,556	130,411
4	1.8	2,420	6,534	7,986
5	0.0	0	0	0
6	1.2	1,613	6,776	2,904
7	35.0	47,056	174,106	131,756
8	0.8	1,076	5,916	2,151
9	0.0	0	0	0
10	7.8	5,243	13,633	1,049
11	1.6	1,721	3,657	12,046
12	12.9	10,406	1,734	45,093
13	0.0	33,396	70,503	215,219
Total	109.0	119,427	334,471	550,792

Section Four

Topsoil & Subsoil Salvage

Table 4-3.3. Estimated topsoil and subsoil quantities that can be salvaged from year 3 mining disturbance areas.

Map Unit	Area	Topsoil	Good/ Fair Subsoil	Poor Subsoil
	acres	Cubic Yards	Cubic Yards	Cubic Yards
1	0.0	0	0	0
2	0.0	0	0	0
3	0.0	0	0	0
4	0.0	0	0	0
5	0.0	0	0	0
6	0.0	0	0	0
7	11.4	15,327	56,709	42,915
8	6.6	8,873	48,803	17,747
9	0.0	0	0	0
10	0.0	0	0	0
11	0.0	0	0	0
12	18.1	14,601	2,433	63,270
13	2.4	2,904	6,131	18,715
Total	38.5	41,705	114,076	142,646

Table 4-4. Estimated topsoil quantities that will be salvaged where facilities, roads, and stockpiles will be constructed in Coal Hollow project area during year 1.

Map Unit	Facilities, Roads, and Stockpile Disturbance Area	Topsoil
	acres	cubic yards
1	36.7	44,407
2	13.2	12,423
3	0.3	242
4	8.6	11,562
5	14.6	13,740
6	0.0	0
7	4.5	6,050
8	11.1	14,923
9	16.4	22,049
10	1.1	739
11	6.7	7,206
12	0.0	0
13	1.0	1,210
Totals	107.5	134,552

Estimated quantities of salvaged topsoil and subsoil should be sufficient to construct a reclamation profile with a minimum thickness of 48 inches as required by Utah DOGM regulations (p. 4, Utah DOGM, 2005). Table 4-5 lists the total estimated quantities of topsoil and subsoil by mining year and the resulting soil profile that could be constructed, if all of the estimated material was salvaged. These estimated quantities are presented for the purpose of illustrating that there

Section Four

Topsoil & Subsoil Salvage

should be sufficient quantities of topsoil and subsoil to construct a 48 inch soil profile.

Topsoil replacement on the roads, facilities, and stockpile areas is estimated to be 8 to 9 inches.

Table 4-5. Estimated total quantities of topsoil and subsoil by mining year¹.

Mining Year	Topsoil Salvage	Good/Fair Subsoil Salvage	Poor Subsoil Salvage	Acres
	Cubic Yards	Cubic Yards	Cubic Yards	Cubic Yards
1	210,916	579,146	848,869	178.4
2	119,427	334,471	550,792	109.0
3	41,705	114,076	142,646	38.5
Total	372,048	1,027,693	1,542,306	325.9

1. Quantities are for mined areas only and do not include materials salvaged from roads, facilities, and stockpile areas.

Table 4-6. Potential reclamation soil profile thickness based on estimated topsoil and subsoil quantities listed in table 4-5 for the mining disturbance areas.

Mining Year	Topsoil Salvage	Good/Fair Subsoil Salvage	Poor Subsoil Salvage	Total Reclamation Profile Depth
	Inches	Inches	Inches	Inches
1	9	24	36	70
2	8	23	38	69
3	8	22	28	58
Weighted Project Average ¹	8.5	23.5	35.2	67

1. Weighted average determined by multiplying the depth for each year by the respective acres, summing the values and then dividing by the total project acres. Acres are listed in Table 4-5.

R645-301-232.500, Commitments made concerning topsoil and subsoil sampling in Sec. 232.500; Sec. 5, pg. 5-3, App. 2-1; and Sec. 232.720 are appropriate, but in each case, the commitment should include the rate of sampling, i.e. number of samples to be taken by ton or by cubic yardage moved. • Overburden monitoring described in Sec. 5, pg. 5-3, App. 2-1 should include SAR analysis.

The following page replaces page 5-3, Chapter 5 in Appendix 2-1. The last paragraph on this page is revised to reference the detailed description of the subsoil sampling program in Chapter 2, Section 232.500, page 2-24.

guidelines (Utah DOGM, 2005). Depending on location, the upper twenty to fifty feet of mixed alluvial (non-shale) overburden is suitable for use as substitute subsoil, based on lab analysis of samples from deep backhoe pits at core hole locations 1, 3, 5, and 6 in April 2007, and core hole 8 in November 2007. Table 5-2, shows the maximum, minimum, and average lab analysis values for the April 2006 core hole samples. The average values in table 5-2 represent an estimate of the resulting values when material from below the topsoil layer and above thirty feet is mixed during excavation. Laboratory analysis results of this overburden testing are in appendix C.

Table 5-2. Ranges and averages of soil suitability for overburden sampled from pits adjacent to core holes 1, 3, 5, and 6 (April 2007) and core hole 8 (November 2007). Data is for alluvial material above 40 feet. Tropic shale overburden is unsuitable for use as subsoil substitute and has not been included in this table.

	Maximum	Minimum	Average
Sand %	82.0	0	35.3
Silt %	61.0	13.0	35.9
Clay %	61.0	5.0	28.8
texture			Clay Loam
pH	8.4	7.8	8.2
ECe (ms/m)	4.20	0.25	0.67
Saturation %	97.6	20.2	52.6
SAR	3.94	0.05	0.63
AcidBase Potential t/kT	650	160	315
Lime %	64.7	15.6	31.56
Organic Carbon	1.21	0.11	0.46
Boron	0.40	<0.10	0.29

The only parameter listed in table 5-2 with an average value that could be limiting to the establishment of vegetation would be the percent lime. Percent lime values for 9 of the 16 samples are between 15 and 30 percent, which puts them in the fair category (Utah DOGM, 2005).

Tropic shale is closer to the surface at the core hole 7 location which has resulted in the overburden being unacceptable for use as subsoil. SAR values ranges from 15.9 to 52.2 below 6 feet. Conductivity in this material ranges from 0.90 to 10.0 mmhos/cm. Percent clay ranges 49 to 61 percent. Materials similar to that characterized by core hole 7 should not be used as substitute subsoil within the 48 inch reclamation soil profile; and should be covered with as much suitable alluvium as possible.

ACD will conduct a monitoring program in the field during mining operations to ensure that only materials with good or fair suitability are placed in the upper 4 feet of the reclamation soil profile (p. 4, Utah DOGM's *Guidelines for Management of Topsoil and Overburden*, 2005). Representative overburden samples will be analyzed for SAR at a qualified laboratory. A detailed description of the subsoil monitoring program is provided in Chapter 2 under Section R645-301-232.500, page 2-24.

The following pages replace soils analysis C07040226 in Appendix C, Appendix 2-1, Chapter 2, Volume 1. This analysis is replaced with data sheets that show the letterhead for the laboratory that performed the analysis.



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LABORATORY ANALYTICAL REPORT

Client: Alton Coal Development / Talon Resources
Project: Coal Hollow
Workorder: C07040226

Report Date: 04/24/07
Date Received: 04/05/07

Sample ID	Client Sample ID	Analysis	EC SatPst	Saturation SatPst	Lime as CaCO3	pH SatPst	NO3 Soluble	K Soluble	K SatPst	K NH4OAc	P, Olsen- NAHCO3	Ca SatPst	Mg SatPst	Na SatPst	SAR
			Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results	Results
C07040226-001 SP-28		0-8	0.47	60.2	18.9	7.7	3.9	7.56	0.32	1.0	<5	2.8	2.3	1.0	0.65
C07040226-002 SP-28		8-24	0.48	65.4	17.6	8.0	1.8	4.44	0.17	0.77	<5	1.8	2.4	2.2	1.50
C07040226-003 SP-28		24-48	5.94	72.6	18.5	8.1	2.8	13.6	0.48	0.77	<5	13	42	29	5.50
C07040226-004 SP-35		0-9	0.56	55.4	16.7	7.7	5.1	27.7	1.3	1.8	45	4.0	2.7	0.20	0.11
C07040226-005 SP-35		9-19	0.44	54.8	17.4	7.9	1.1	27.0	1.3	1.6	25	2.4	2.3	0.19	0.12
C07040226-006 SP-35		19-30	0.40	31.5	15.0	8.2	1.1	20.1	1.6	1.1	5	1.5	1.8	0.28	0.22
C07040226-007 SP-35		30-45	0.37	30.5	17.7	8.4	1.1	24.1	2.0	0.70	<5	0.98	1.4	0.23	0.22
C07040226-008 SP-35		45-70	0.48	37.3	18.0	8.8	1.0	45.9	3.1	1.3	<5	0.73	1.4	0.37	0.37
C07040226-009 SP-37		0-6	0.51	46.7	4.5	7.8	3.9	8.71	0.48	0.83	10	5.1	2.1	0.16	0.08
C07040226-010 SP-37		6-12	0.44	45.4	7.5	7.7	6.5	7.15	0.40	0.71	<5	4.2	1.8	0.16	0.09
C07040226-011 SP-37		12-24	0.29	38.7	11.1	8.0	1.9	3.94	0.26	0.35	<5	2.3	1.4	0.18	0.13
C07040226-012 SP-37		24-38	0.25	35.2	15.3	8.2	2.0	1.24	0.09	0.06	<5	1.6	1.7	0.18	0.14
C07040226-013 SP-37		38-58	0.27	30.3	17.3	8.2	1.5	1.22	0.10	0.069	<5	1.5	2.0	0.44	0.34
C07040226-014 SP-38		0-6	0.47	69.9	24.7	8.0	2.7	14.2	0.52	0.74	8	3.2	3.4	0.17	0.09
C07040226-015 SP-38		6-12	0.33	81.8	17.8	8.3	1.8	5.55	0.17	0.42	<5	1.5	3.4	0.23	0.15
C07040226-016 SP-38		12-20	0.49	71.1	28.3	8.5	1.4	2.58	0.09	0.23	<5	1.3	5.2	0.70	0.39
C07040226-017 SP-38		20-24	0.57	71.5	44.5	8.3	3.0	3.04	0.11	0.21	<5	1.8	5.8	0.84	0.44
C07040226-018 SP-39		0-6	0.32	43.7	8.5	7.8	2.1	2.87	0.17	0.45	6	3.1	1.2	0.27	0.19
C07040226-019 SP-39		6-12	0.38	41.9	7.9	7.8	1.7	3.07	0.19	0.45	<5	3.9	1.5	0.34	0.21
C07040226-020 SP-39		12-24	0.23	35.3	13.9	8.0	1.2	1.46	0.11	0.17	<5	2.2	0.98	0.30	0.24
C07040226-021 SP-39		24-36	0.20	32.3	14.4	7.9	1.2	1.10	0.09	0.089	<5	1.7	1.0	0.20	0.17
C07040226-022 SP-40		0-6	0.53	85.8	14.4	8.0	1.5	19.0	0.57	1.1	11	2.3	4.6	0.86	0.47
C07040226-023 SP-40		6-12	1.81	88.4	18.0	8.4	1.1	13.2	0.38	0.50	6	3.1	20	3.8	1.01
C07040226-024 SP-40		12-22	1.29	76.1	19.9	9.0	1.1	5.83	0.20	0.26	6	0.51	14	4.1	1.48
C07040226-025 SP-41		0-6	0.46	51.3	14.5	8.0	1.4	29.1	1.5	1.1	8	3.9	1.7	0.20	0.12
C07040226-026 SP-41		6-12	0.53	54.9	12.1	8.0	4.7	22.4	1.0	1.5	6	4.4	2.7	0.27	0.15
C07040226-027 SP-41		12-36	0.22	69.0	16.6	8.1	1.1	5.32	0.20	0.69	<5	1.4	1.6	0.19	0.15
C07040226-028 SP-41		36-64	0.43	63.9	18.5	8.2	1.1	6.72	0.27	0.41	<5	1.4	3.9	0.65	0.40
C07040226-029 SP-41		64-80	0.66	31.5	17.3	8.8	1.2	3.50	0.28	0.15	<5	0.67	5.7	2.9	1.63
C07040226-030 SP-42		0-9	0.33	42.8	18.0	7.9	3.9	6.62	0.39	0.42	5	3.7	0.97	0.16	0.10
C07040226-031 SP-42		9-24	0.28	60.9	18.5	8.1	3.5	8.00	0.34	0.81	<5	2.5	1.3	0.26	0.19
C07040226-032 SP-42		24-38	0.32	44.7	16.0	8.3	1.5	6.81	0.39	0.38	<5	2.3	2.9	0.31	0.20
C07040226-033 SP-42		38-48	0.28	31.4	18.2	8.6	1.4	5.31	0.43	0.43	<5	0.94	1.8	1.3	1.14



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LABORATORY ANALYTICAL REPORT

Client: Alton Coal Development / Talon Resources
Project: Coal Hollow
Workorder: C07040226
Report Date: 04/24/07
Date Received: 04/05/07

Sample ID	Client Sample ID	Analysis		Sand	Silt	Clay	Texture
		Units	Depth	Results	Results	Results	Results
C07040226-001	SP-28	0-8	2.5	7.0	38	55	C
C07040226-002	SP-28	8-24	1.4	8.0	34	57	C
C07040226-003	SP-28	24-48	1.0	4.0	36	60	C
C07040226-004	SP-35	0-9	4.3	12	44	44	SIC
C07040226-005	SP-35	9-19	1.8	18	40	44	SIC
C07040226-006	SP-35	19-30	1.2	51	27	22	SCL
C07040226-007	SP-35	30-45	0.75	59	27	14	SL
C07040226-008	SP-35	45-70	0.88	42	39	19	L
C07040226-009	SP-37	0-6	4.0	38	30	32	CL
C07040226-010	SP-37	6-12	2.9	48	23	29	SCL
C07040226-011	SP-37	12-24	3.0	56	24	20	SL - SCL
C07040226-012	SP-37	24-38	0.67	71	18	11	SL
C07040226-013	SP-37	38-58	0.45	73	18	9.0	SL
C07040226-014	SP-38	0-6	6.2	12	44	44	SIC
C07040226-015	SP-38	6-12	3.4	2.0	47	51	SIC
C07040226-016	SP-38	12-20	1.9	11	48	43	SIC
C07040226-017	SP-38	20-24	1.1	10	42	48	SIC
C07040226-018	SP-39	0-6	2.3	38	33	31	CL
C07040226-019	SP-39	6-12	2.4	38	30	32	CL
C07040226-020	SP-39	12-24	1.2	62	20	18	SL
C07040226-021	SP-39	24-36	0.50	75	15	10	SL
C07040226-022	SP-40	0-6	5.7	10	42	48	SIC
C07040226-023	SP-40	6-12	2.9	5.0	44	51	SIC
C07040226-024	SP-40	12-22	1.4	21	44	35	CL
C07040226-025	SP-41	0-6	3.3	46	26	28	SCL
C07040226-026	SP-41	6-12	3.4	25	34	41	C
C07040226-027	SP-41	12-36	1.7	6.0	44	50	SIC
C07040226-028	SP-41	36-64	0.96	12	52	36	SICL
C07040226-029	SP-41	64-80	0.56	54	31	15	SL
C07040226-030	SP-42	0-9	2.4	50	30	20	L
C07040226-031	SP-42	9-24	2.8	8.0	49	43	SIC
C07040226-032	SP-42	24-36	1.7	52	27	21	SCL
C07040226-033	SP-42	36-48	0.92	44	34	22	L

The following pages replace soils analysis C07041141 in Appendix C, Appendix 2-1, Chapter 2, Volume 1. This analysis is replaced with data sheets that show the letterhead for the laboratory that performed the analysis.

LABORATORY ANALYTICAL REPORT

Revised Date: 05/17/07
Report Date: 05/13/07
Date Received: 04/24/07

Client: Alton Coal Development / Talon Resources
Project: Coal Hollow
Workorder: C07041141

Sample ID	Client Sample ID	Analysis	EC		Saturation		Lime as		pH		NO ₃		K		K		K		P, Olsen-		Se		Ca		Mg		Na	
			SatPst	mmhos/cm	%	SatPst	%	CaCO ₃	s_u_	SatPst	Soluble	mg/kg-dry	SatPst	mg/L	SatPst	mg/L	NH ₄ OAc	mg/kg-dry	mg/L	mg/kg-dry	mg/L	mg/L	SatPst	mg/L	SatPst	mg/L	SatPst	mg/L
		Units																										
		Depth																										
C07041141-001	Alton 48	0-3	0.52	85.6	4.5	7.7	2.6	8.41	0.19	1.1	0.79	0.86	0.94	1.1	10	<0.001	3.6	1.3	1.4									
C07041141-002	Alton 48	3-12	0.57	95.4	7.2	8.0	1.1	2.39	0.06	0.79	2.39	5.38	7.36	11.8	8	<0.001	1.2	0.55	4.4									
C07041141-003	Alton 48	12-30	2.63	106	7.5	8.2	1.3	5.38	0.13	0.86	5.38	7.36	11.8	9	7	<0.001	3.0	1.8	17									
C07041141-004	Alton 48	30-48	4.65	81.0	5.2	8.1	<1.0	7.36	0.23	0.94	7.36	11.8	11.8	11	7	<0.001	6.5	4.1	29									
C07041141-005	Alton 48	48-84	6.20	87.5	4.0	7.9	1.4	11.8	0.35	1.1	11.8	11.8	11.8	11	9	<0.001	15	8.1	37									

LABORATORY ANALYTICAL REPORT

Revised Date: 05/17/07
Report Date: 05/13/07
Date Received: 04/24/07

Client: Alton Coal Development / Talon Resources
Project: Coal Hollow
Workorder: C07041141

Sample ID	Client Sample ID	Analysis		SAR	Very Fine Sand		Sand	Silt		Clay	Texture		Organic Matter	
		Units	Depth	unifless	%	Results	%	Results	%	Results	Results	Results	%	Results
C07041141-001	Alton 48		0-3	0.92	4.8	7.0	33	60			C		3.5	
C07041141-002	Alton 48		3-12	4.68	5.3	6.0	30	64			C		1.9	
C07041141-003	Alton 48		12-30	11.2	11	12	28	60			C		1.7	
C07041141-004	Alton 48		30-48	12.7	9.5	10	28	62			C		1.6	
C07041141-005	Alton 48		48-84	10.8	6.5	7.0	30	63			C		1.5	

The following pages replace soils analysis C07040695 in Appendix C, Appendix 2-1, Chapter 2, Volume 1. This analysis is replaced with data sheets that show the letterhead for the laboratory that performed the analysis.



LABORATORY ANALYTICAL REPORT

Report Date: 05/06/07
Date Received: 04/16/07

Client: Alton Coal Development / Talon Resources
Project: Coat Hollow Project
Workorder: C07040695

Sample ID	Client Sample ID	Analysis	EC		Saturation		Lime as		pH		NO ₃		K		K		K		P, Olsen-		Ca		Mg		Na		SAR	
			Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units	Results	Units
C07040695-001	Alton 49	0-3	0.42		58.0	%	17.8	%	8.1		< 1.0		7.04	mg/kg-dry	0.31	meq/L	0.46	meq/100g	7	mg/kg-dry	2.9	meq/L	1.5	meq/L	0.07	meq/L	0.05	unitless
C07040695-002	Alton 49	3-10	0.34		55.5	%	17.7	%	8.4		< 1.0		7.32	mg/kg-dry	0.34	meq/L	0.39	meq/100g	8	mg/kg-dry	2.0	meq/L	1.5	meq/L	0.08	meq/L	0.06	unitless
C07040695-003	Alton 50	0-4	0.20		75.4	%	18.5	%	8.4		1.4		6.36	mg/kg-dry	0.22	meq/L	0.78	meq/100g	6	mg/kg-dry	1.6	meq/L	0.36	meq/L	0.13	meq/L	0.13	unitless
C07040695-004	Alton 50	4-11	0.27		66.2	%	18.7	%	8.1		1.4		6.08	mg/kg-dry	0.24	meq/L	0.81	meq/100g	8	mg/kg-dry	1.9	meq/L	0.53	meq/L	0.32	meq/L	0.29	unitless
C07040695-005	Alton 50	11-19	0.30		72.0	%	18.5	%	8.4		1.3		4.97	mg/kg-dry	0.18	meq/L	0.65	meq/100g	9	mg/kg-dry	1.9	meq/L	0.59	meq/L	0.57	meq/L	0.52	unitless



LABORATORY ANALYTICAL REPORT

Report Date: 05/06/07
Date Received: 04/16/07

Client: Alton Coal Development / Talon Resources
Project: Coal Hollow Project
Workorder: C07040695

Sample ID	Client Sample ID	Analysis		Sand		Silt		Clay		Texture		Organic Matter	
		Units	Depth	%	Results	%	Results	%	Results	%	Results	%	Results
C07040695-001	Alton 49	0-3	20	49	31	SiCL	2.0						
C07040695-002	Alton 49	3-10	28	47	27	CL - L	2.3						
C07040695-003	Alton 50	0-4	5.0	37	58	C	1.4						
C07040695-004	Alton 50	4-11	< 1.0	39	61	C	1.3						
C07040695-005	Alton 50	11-19	6.0	39	55	C	1.4						

The following drawing replaces Drawing 2-1 in Chapter 2, Volume 1. This drawing is updated to reflect the changes in the disturbance area of the facilities and the water system.

Also:

A small delineation of map unit 3 in the southeast corner of the Year 1 area was changed to map unit 2. This change was made after soil depths were checked on October 2, 2008 and found to be 27 inches to shale. Map unit 3 consists of very deep (greater than 60 inches deep) soils, while map unit 2 contains moderately deep (20 to 40 inches deep) and very deep soils. This soil map update corresponds with geologic drilling results, which found that the depth to shale was shallower in this area.

The change consists of 1.5 acres in the Year 1 area and 0.9 acres in the Year 2 area.

This change only affects tables 4-3.1, 4-3.2, 4-5, and 4-6. Topsoil, Good/Fair Subsoil, and Poor Subsoil quantities and depths were updated accordingly in these tables for map units 2 and 3.

The net change in replaceable soil profile depth was two inches in Year 1 and less than one inch for the permit area. The estimated amount of salvageable materials still results in an estimated replaceable soil depth of 67 inches, which is substantially more than the 48 inches required by Utah DOGM.

The following drawing replaces Drawing 2-2 in Chapter 2, Volume 1. This drawing is updated to reflect the changes in the disturbance area of the facilities and water system. The legend is also updated to change project area to permit boundary.